

Analysis for the adoption of Non-Motorized Transport(NMT) Facilities for the BRTS Corridor :A Case Study of Ahmedabad

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Abstract

At present, the CO₂(carbon dioxide) emission per capita in India is approximately one-fourth of the world's average CO₂ emission, with the transport sector contributing to about 10% of the total CO₂ emissions (IEA, 2010). In India, the emissions from the transport sector have been growing day by day. Besides CO₂ emissions, the transport sector is also responsible for negative impacts like road congestion, local air pollution, noise and accidents. In urban areas, the share of both public transport and NMT has been decreasing, resulting in increasing negative externalities. So, developing the country towards sustainable transport system like NMT is becomes very much important. Non-Motorized Transport mainly includes walking, cycling, small-wheeled transport and wheelchair travel. These modes provide both recreation and transportation although users may consider a particular trip to serve both objectives. Conventional planning approaches have focused on the movement of vehicles rather than people while a large percentage of trips in Indian cities, falling below 3 to 4 km lengths, are performed by walking and cycling. NMT modes are environmentally friendly modes that promote healthy lifestyles and economic independence. They also contribute to social equity by providing increased accessibility and mobility to all economic classes. Despite this, the importance and safety of pedestrians and non-motorized vehicles (NMVs) in Indian cities has been largely undermined. There is a severe need to realign planning priorities and pay special attention to NMT in transportation planning. In this paper the analysis of selected BRTS nodes has been carried out to know the need of NMT facilities and to provide sustainable mode of transport. In this research Ahmedabad city is selected for the adoption of NMT facilities.

Keywords: Carbon dioxide(CO₂) ,Non-Motorized Transport(NMT) ,Non-Motorized Vehicle(NMV),Ahmedabad

INTRODUCTION

India's transport sector is a rapidly growing sector and contributes 6.4 % to the GDP of the country. The sector is largely oil dependent and accounts for 13 % of the country's energy-related carbon emissions. In 2012, the city Ahmedabad added 6.9 lakh two wheelers while in 2014 there were 16 lakh new two wheelers. In 2012, there were 1.2 lakh new cars hitting Ahmedabad roads and this number was 2.8 lakh in 2014. The numbers are surely going to increase further but the space on our road is limited. So, this increase in vehicular growth resulted in traffic congestion and accidents. So, Public transport and non-motorized transport is the future of transportation. 1 Non-Motorized Transport includes mainly walking, cycling and cycle rickshaws. All of them are green modes of transport their carbon footprint is very low, energy consumption is minimal and their

emissions are zero. In addition they are not dependent on any kind of fossil fuels and that is the reason why it is very inexpensive and affordable for every class of people as compared to the motorized form of transport. Low income people in our nation mainly depends on NMT walking and cycling for their daily life commuting process. Also, walking and cycling has immense health benefits. Still, NMT is very often neglected in our transport models and policies. Pedestrians and cyclists are the most vulnerable street users. The physical road conditions for walking and cycling in Indian cities are not convenient, despite having such a high modal share. These choices are reflected that the commuters have lack of options because of low income level and unreliability of other system like motorized and public transport. Given a choice, people will move out of walking and cycling to private motorized modes which have better support infrastructure. This is why economic development is leading to increased motorization in our cities. The primary challenge of NMT in our cities is to convert this captive use to choice use by planning and designing better infrastructure and policy environments for pedestrian and bicyclist.

Table 1: Road Safety Data

Sr. No	Road Safety	Ahmedabad Indicator Value- Road Safety	
		2015	2012
1	Fatalities per Lakh Population	5	4
2	Fatality Rate for Pedestrian & NMT (%)	52%	56%
3	Serious Injuries per Lakh Population	6	6

Legend - Change Colour Code

	No Change
	Positive Change
	Negative Change

Source: CoE in Urban Transport, CEPT University, Ahmedabad

The table:1 shows the road safety data of Ahmedabad city. From this table it is clear that fatality rate of pedestrian and bicyclist is high and also it is not decreasing there is no change in the fatality rate of pedestrian and NMT users. The major concern though is that 8% of road fatalities involve people on cycles followed by 30% of two-wheelers and 49% of pedestrians. Thus, about 57% of fatalities are attributed to the non-motorized travel. Over 8% of fatalities belong to those on bicycles.

Table 2: Modal Share of Indian Cities

Name of City	Population (Million)	Walk	Cycle /Rick shaw	IPT	Public Transport	Cars	Two wheelers
Bengaluru	5.70	28	23	18	26	16	07
Pune	4.20	22	11	07	12	12	35
Kanpur	2.73	30	18	07	06	07	32
Lucknow	2.24	38	26	08	00	04	24
Ahmedabad	5.41	22	19	05	15	20	24

(Source: Report of National Transport Development Policy Committee on Urban Transport, 2013)

The table:2 shows the modal split of five Indian cities. From this we get to know that the share by personalized modes, particularly two wheelers are very high in virtually all the cities. The percentage of trips by bicycle and walk is seen to decrease with increase in size of the city. The prevailing imbalance in modal split that is, inadequate mass transit, decline in walking and bicycle trips, rise in the use of para-transit and personalized transport leads to congestion, energy waste, accidents as well

as pollution. This shows the demand of proper NMT development to reduce accident, traffic congestion and development of sustainable transportation system.³

OBJECTIVES OF THE STUDY

- To identify the area most suitable for NMT movement in Ahmedabad city
- To analyze the willingness to adopt NMT facility

NEED OF THE STUDY

From fig.1 we can see that the level of pollution level 1-100 is considered as good environmental condition where as when this level keep on increasing the environmental conditions keeps on deteriorating. We can see that, the level of pollution is above 200 in Ahmedabad. If we keep on using motorized transport then soon in future the conditions will worsen. To keep the environmental condition in control the use of non-motorized transport should be adopted.

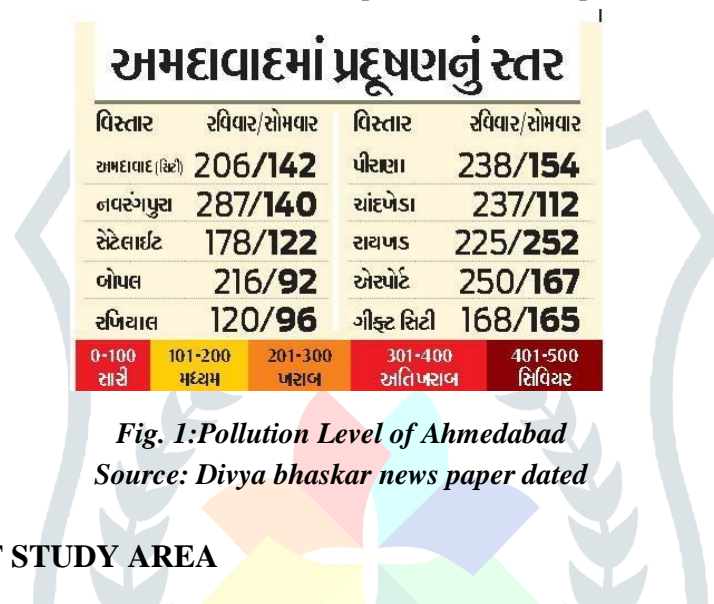


Fig. 1: Pollution Level of Ahmedabad
Source: Divya bhaskar news paper dated

SELECTION OF STUDY AREA



Fig. 2: Study area

By studying whole AMC area and looking to the current scenario and BRTS users I have identified most suitable area for NMT adoption. There is two big universities like Gujarat university and CEPT university are there in this area and many other educational institutions are there. Due to the absence of systematic parking and traffic sense, the actuality is taken away by chaotic parking and vending activity which leads to traffic congestion during the peak hours and leave negligible amount of space for pedestrians and cyclists to thrash out their way safely. The major significance of studying this is to depict and describe a secure, coherent, easy to use and high quality network of Non-Motorized Transport and encourage the people throughout community to use in entire area.

DATA COLLECTION

Primary survey is conducted from different stakeholders, who are frequently or daily travelling through the node. The method adopted for survey is questionnaire survey. The questionnaire includes parameters like age, gender, household size, household income, trip information and about their willingness to shift from motorized to non motorize

DATA ANALYSIS

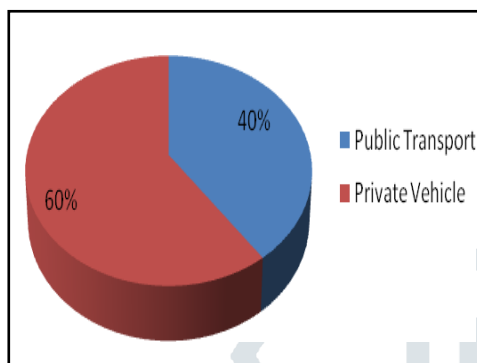


Fig. 3: Mode of Transport

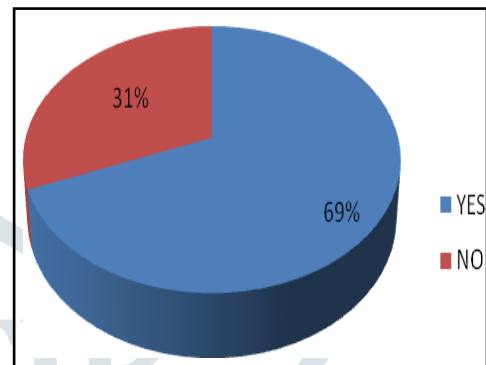


Fig. 4: Willingness to Shift, Private Users

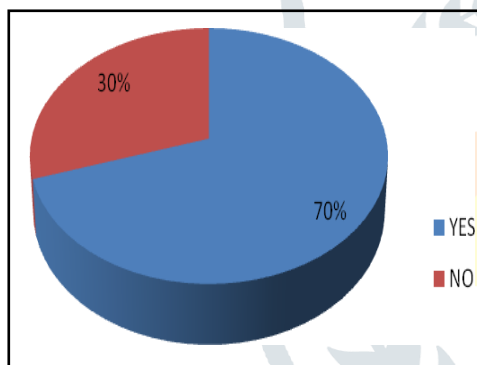


Fig. 5: Willingness to Shift, PT Users

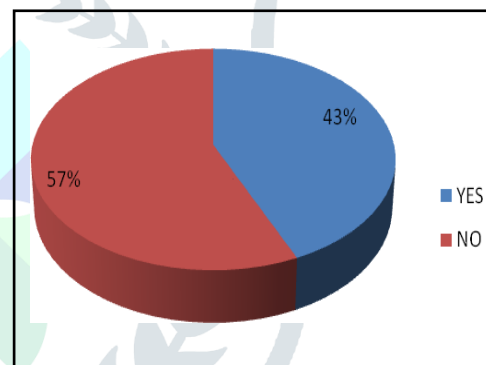


Fig. 6: Cycle Ownership

From the survey it has been found that, 40% people using public transport like BRTS, AMTS and auto rickshaw and 60% using their private mode of transport like two wheelers and four wheelers. It means that more people using their private mode of transport because of some inconvenience of public transport and last mile connectivity of public transport as in fig. 3.

From private vehicle users 69% people wants to shift from motorized to non-motorized if proper facility in terms of last mile connectivity is provided for BRT and other mode of public transport facility. But the rest 31% don't want to shift because of the convenience of private transport because of some reasons like long distance, time of travel, safety as in fig. 4.

From public transport user 70% people wants to shift from motorized to non-motorized if last mile connectivity for their mode of transport like BRTS and AMTS is provided. Rest 30% doesn't want to shift because their destination is near to the station of their mode of travel as in fig. 5.

From fig. 6, 43% people have cycle but only 2 to 3% people using cycle for different purposes. So, we attract people by creating green spaces and providing attractive facilities like segregated lanes, PBS, parking etc.

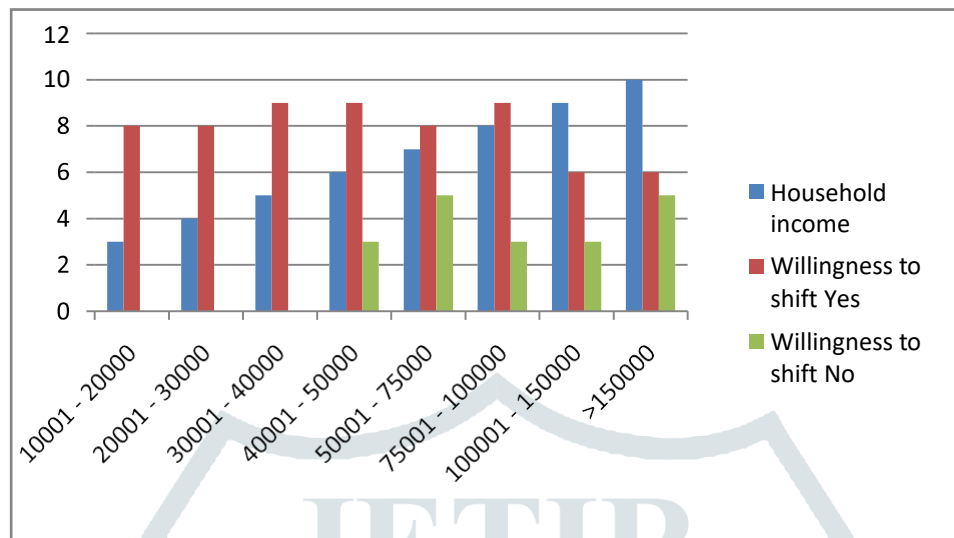


Fig. 7: Household income vs. willingness to shift

Data has been more analysed by conducting relation with their household income. And it is carried out that

- HIG people does not want to shift because of their standard of living
- MIG and LIG people wants to shift if proper service in terms of last mile connectivity is provided"

From the fig.7 we get to know that the lower income group people more likely to shift to NMT facilities because of the affordability of the NMT facilities because no fossile fuels used in this transport system so, every group of people easily afford NMT facilities.

RECOMMENDATIONS

- Provision of segregated lanes for bicyclist and pedestrians
- Provision of Public Bicycle Sharing system integrated with BRTS
- Provision of separate signaling system for pedestrian and bicyclist
- Reduce carbon emission by providing NMT facilities
- Create awareness about NMT
- Provision of first and last mile connectivity for BRTS
- Provision of dedicated , high quality and user friendly facilities such as shaded pedestrian pathways and cycle tracks supported by public amenities.
- Provision of safe and secure environment such as parking of bicycles, street lighting and organized spaces for the informal sector
- Integration of walking and cycling facilities with transit
- Planning for compact and walkable neighbourhoods with mixed land uses
- Leveraging public events such as Car Free Day, Raahgiri, and other similar initiatives to promote the message of sustainable transportation
- Provision of incentives at offices for using NMT services
- Disincentivise usage of motorized modes by making motorists pay the full societal costs of their transport.

- Develop interconnected streets and blocks system with routes providing direct connections between origins and destinations.
- Make NMT connections more attractive and time saving in comparison to motorized modes.
- Create a balance between the movement of pedestrians, cyclists, transit, and vehicles.
- Promote cycling as a viable alternative to motorized modes of transport.
- Encourage active lifestyle with health benefits and a sustainable alternative to motorized modes of transport.
- Provision of an attractive pedestrian environment with a high level of priority, safety, and amenities.

CONCLUSIONS

People are moving towards healthy lifestyle now a days. It is important to provide healthy environment also. Most of the pollution increase is because of the increase of vehicular traffic. So, it is clear from the above discussion that non-motorized modes of transport which include bicycles, pedestrian and rickshaws are an integral part of the transport system. From this study it has been found out that more than half of the BRTS users are ready to adopt NMT facilities for their last mile connectivity which will give them pollution free environment. The usages of non motorized modes particularly the cycles need to be encouraged with the provision of appropriate facilities like segregated lanes, parking, street lights etc. for its safe and efficient movement on high-density corridors. The pedestrians are the most neglected class of road user in the city. Appropriate pedestrian facilities both segregated and „at grade” need to be developed. Though there is a high demand of cycling and pedestrian infrastructure it is not provided in proper manner resulted in higher accident rate of bicyclist and pedestrian. To reduce the fatality rate of pedestrian and bicyclist it is very important to promote Non-Motorized Transportation.

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